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Catherine M H Keske, Jennifer Brooke Dare, Tiffany Hancock, Myron King. The connectivity of food security, food sovereignty, and food justice in boreal ecosystems: the case of Saint-Pierre and Miquelon. *Justice spatiale = Spatial justice*, 2016, Food justice and agriculture, 9, <http://www.jssj.org/article/la-connexion-entre-la-securite-alimentaire-la-souverainete-alimentaire-et-la-justice-alimentaire-dans-les-ecosystemes-boreals-le-cas-de-saint-pierre-et-miquelon/>. halshs-01507249

HAL Id: halshs-01507249

<https://shs.hal.science/halshs-01507249>

Submitted on 13 Apr 2017

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The connectivity of food security, food sovereignty, and food justice in boreal ecosystems: the case of Saint-Pierre and Miquelon

Catherine M.H. Keske, Ph.D.

Associate Professor, Memorial University of Newfoundland, Grenfell Campus, Division of
Social Science, Environmental Studies (ECON)

Jennifer Brooke Dare, B.A.

Master of Arts Candidate, Memorial University of Newfoundland, Grenfell Campus,
Division of Social Science, Environmental Policy Institute

Tiffany Hancock, M.A.

Lecturer, Memorial University of Newfoundland, Grenfell Campus, Division of Arts,
French Studies

Myron King, M.Sc.

Research Associate, Memorial University of Newfoundland, Grenfell Campus,
Environmental Policy Institute

Abstract

This article presents a case study of the Saint-Pierre and Miquelon (France) archipelago in order to identify the network and flow of agricultural resources within the circumpolar northern hemisphere known as a “boreal ecosystem” or “boreal ecozone”. We emphasize that climate and the existence of food insecurity within wealthy nations should be factored into conceptualizations of food sovereignty and food justice. The self-governing territory’s remote distance from the mainland exemplifies food system challenges faced by rural communities with short growing seasons, high transportation costs, and complex natural resource governance. Subsistence agriculture is possible, but infeasible from a practical perspective. Saint-Pierre and Miquelon’s food system is historically based in abundant fishing. Community residents otherwise rely on imports. We conclude that there is opportunity for rural communities in boreal ecozones to

attain spatial food justice if food security goals are balanced with mindfulness to food sovereignty. Equitable access to natural resources and preservation of culturally appropriate food are important dimensions of food sovereignty. If the basic “right to food” is maintained, then food security goals will be balanced over time and spatial justice will be facilitated.

Key words: *boreal ecosystem, food security, food sovereignty, food justice, Saint-Pierre and Miquelon*

Acknowledgements:

Mr. Myron King created the maps that appear in the article. Permission to use all maps, photos, and illustrations is provided under the terms and conditions of Memorial University Newfoundland copyright policy. The authors extend appreciation to Ms. Christina Detcheverry of Saint-Pierre and Miquelon for providing photos and local advisement.

1. Introduction: the effect of climate on food sovereignty, food security, and food justice

We present a case study of the Saint-Pierre and Miquelon (France) archipelago to elucidate the nexus of food sovereignty, food security, and food justice issues in cold climates. Over centuries, inhabitants have been drawn to the archipelago for its abundant fish stocks despite the barren, rocky soils and harsh climate that are not conducive to agricultural production (Berthier, 1962). For generations, Aboriginal persons and New World settlers showed that subsistence living was possible but tenuous. Extraordinarily abundant cod stocks made colonization worthwhile, but essentially the only valuable dietary resource (Berthier, 1962; Fleury, 2006). Evidence suggests that inhabitants relied on trading fish for dietary staples and products from mainland France (Omohundro, 1994; Omohundro, 1995). We assert that this food

system continues in modern times. As a result, the archipelago is vulnerable to resource depletion, trade disruption, and complex domestic and international governance.

In this manuscript, we conduct an in-depth analysis of international maritime law and international fishing regulations and the subsequent impacts of these policies on Saint-Pierre and Miquelon's food sovereignty. Through a series of interviews with Saint-Pierre and Miquelon residents using snowball interviewing techniques (Biernacki and Waldorf, 1981), we document the significance of fisheries on the region's economy and identity. We also review biological survey data of the region's oceanic ecosystem resources (DFA, 2002; DFO, 2007).

Our legal, qualitative, and biological analyses support the premise that the Saint-Pierrais lost sovereignty over local, accessible natural resources with a 1992 International Court of Arbitration decision. Although the ruling was intended to curtail over-fishing, once resources were awarded to Canada, there was arguably greater food insecurity for Saint-Pierre and Miquelon residents. We believe that food justice could provide the basis for restoring Saint-Pierre and Miquelon's sovereignty in relation to these resources.

We assert that food justice can be achieved when residents attain food sovereignty. The most common definition describes food sovereignty as a community's right to determine its own food and agricultural systems (Nyéléni Declaration, 2007). As we demonstrate through our case study of Saint-Pierre and Miquelon, multiple food sovereignty dimensions must also be considered. These include the right to define culturally significant food, equitable access to resources, and the basic right to food (Schanbacher, 2010; Heynen et al., 2012; Windfuhr and Jonsén, 2005; Godfray et al., 2010).

Our analysis of Saint-Pierre and Miquelon is compared with findings from interviews conducted with residents of nearby Newfoundland and Labrador (NL), Canada about local food production (Keske, 2015). Although the two nations are only 25 kilometers apart, their food distribution networks are independent. The neighbors' diets and home food production practices reflect distinctions in French and Canadian cultures,

respectively. Saint-Pierre and Miquelon has been governed by France for 200 years and local diets commensurately reflect French cuisine (Omohundro, 1995). The port also influences how Saint-Pierre and Miquelon residents acquire food and define their food system. The trade route leverages France's influence in North American markets, with famous examples like prohibition-era alcohol smuggling (Timothy, 2001) and wide spread distribution of Atlantic refrigerated and frozen fish (Berthier, 1962).

The proclivity for Saint-Pierre and Miquelon residents to import food has existed for centuries. We posit that this is directly tied to the study region's cold climatic conditions that adversely affect agricultural production. It is well documented that the Saint-Pierrais relied upon imports to supplement fishing. Although residents have likely experienced long-term food insecurity, the situation may be exacerbated during modern times. In developed nations like France and Canada with elaborate social infrastructures, subsistence agricultural production in cold climates can be prohibitively costly and practically infeasible. Therefore, we believe that it is important to illuminate how climate contributes to food system and food security vulnerabilities in these remotely situated territories appurtenant to relatively wealthy nations.

Specifically, it is our assertion that the network and flow of agricultural resources within the circumpolar northern hemisphere known as a boreal ecosystem or boreal ecozone (Brandt, 2009; Natural Resources Canada, 2015) are different from warm climates that are more favorable for agricultural production. Since little has been published about boreal food and agricultural systems, we spend time defining and illustrating the boreal ecosystem and the climatic conditions that characterize the study region. We also believe that a sophisticated understanding of the ecosystem and natural resources is necessary to develop appropriate policies to facilitate food justice.

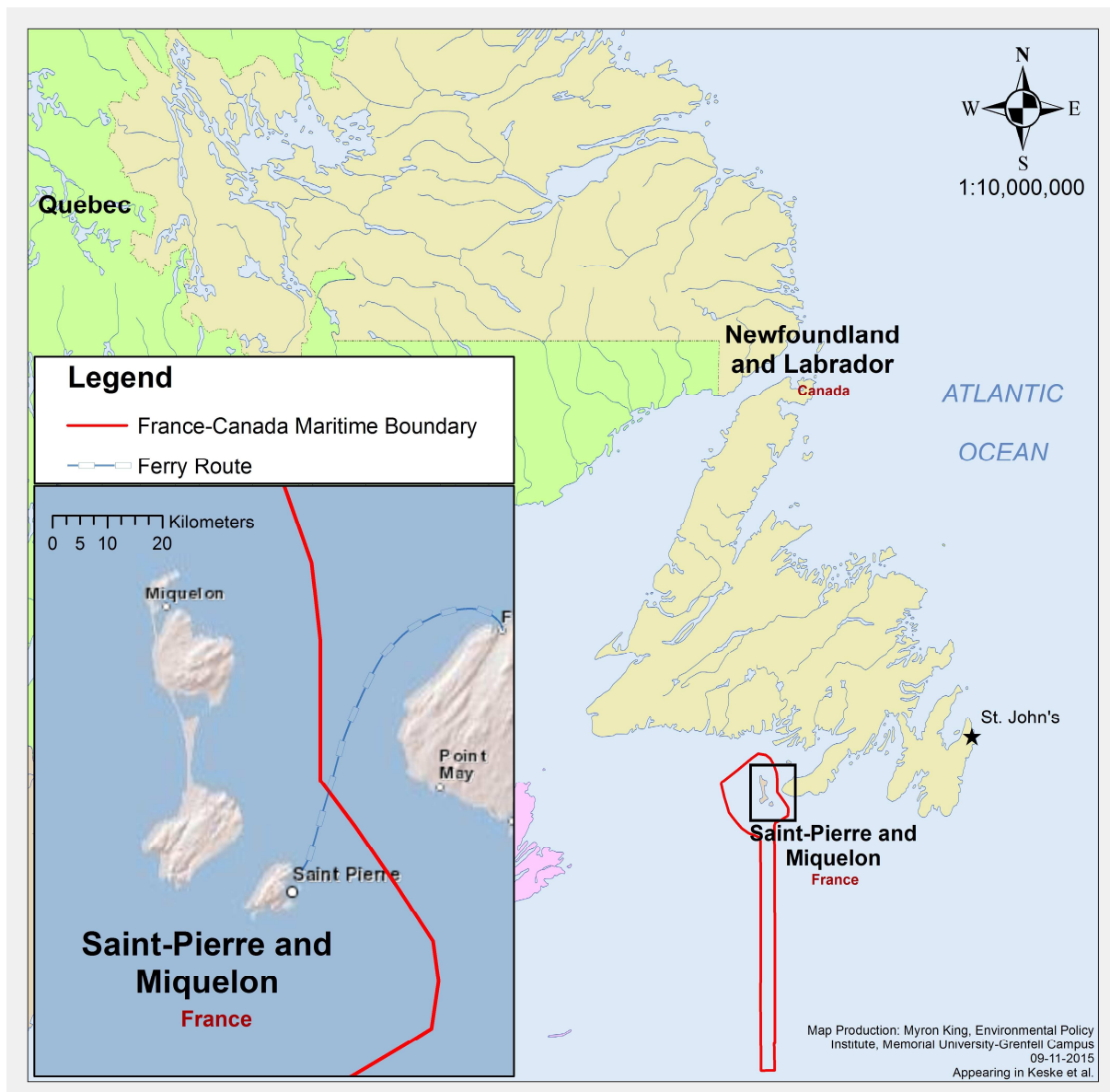
In summary, the climatic conditions and geographic isolation between Saint-Pierre and Miquelon and the mainland illustrates the complex connectivity between food security, food sovereignty, and food justice in cold climates. Despite these challenges, there is opportunity to learn from experience and implement solutions that will improve food

sovereignty, food security, and ultimately, food justice in Saint-Pierre and Miquelon. We use this article as an opportunity to emphasize that climate and the presence of food insecurity within wealthy nations should be factored into conceptualizations of food sovereignty and food justice; furthermore, residents should have the right to define food that is of cultural importance.

2. The Saint-Pierre and Miquelon study region and boreal ecosystem agriculture

We now present a series of maps and photographs to depict the boreal ecosystem and the Saint-Pierre and Miquelon study region. These are accompanied by a detailed description of the natural resources that attracted settlement. These details provide context for how climate may create vulnerabilities for food sovereignty and food security.

As shown in Map 1, France's Saint-Pierre (longitude -56.1809, latitude 46.7788) and Miquelon (longitude -56.3867, latitude 47.1031) archipelago is located approximately 25 kilometers (km) from the coast of Canada's most eastern province of Newfoundland and Labrador (NL), and 3,800 km across the Atlantic Ocean from France's mainland. There is a seasonal ferry between Fortune, NL, Canada, and Saint- Pierre, and limited opportunities for air travel. There are approximately 6,000 inhabitants, with seasonal population increases during warmer months.



Map 1: Map of Study Region, Saint-Pierre and Miquelon Archipelago, France.

The study region, highlighted in red to reflect the France-Canada Maritime Boundary, is located near the south central coast of Newfoundland. The ferry route between France and Canada is also shown. The province of Newfoundland and Labrador is Canada's most eastern province.

This self-governing overseas collectivity of France is the last remnant of “New France” in North America. The complex France-Canada Maritime Boundary, shown in red on Map 1, is viewed as highly contentious by both France and Canada. It is also a source of intrigue to legal scholars (McDorman, 1990; Politakis, 1993; Blake, 2002). Later in the paper, we take this a step further by connecting the region to food sovereignty and food justice. Readers interested in achieving a thorough understanding of the history and specifics of the France-Canada Maritime Boundary Dispute may consult McDorman (1990), Politakis (1993), Blake (2002), and Jacobs (2012), among others.

As shown in Map 1, a 1992 International Court of Arbitration created a 12,000 km² Exclusive Economic Zone (EEZ) for France that extends 188 nautical miles south within a 10.5 nautical mile wide corridor. This corridor extends towards international waters, but it is fully enclosed within Canadian territorial waters. The bulk of the EEZ creation around the archipelago is 121 km wide x 102 km long (65.5 nautical miles x 55 nautical miles). The eastern boundary is half-way between the archipelago and Newfoundland coast. The Saint- Pierrais describe the EEZ somewhat ironically as “uneconomic”, in part because the ocean is deep relative to Canadian waters (Fleury, 2006). Resolving the food sovereignty issues created by the EEZ is a logical step towards delivering food justice for Saint-Pierre and Miquelon residents.

The France-Canada Maritime Boundary reflects the complex history of settlement, fishing rights, and multi-national governance. Relevant countries include France, England, the United States of America, Canada, and Newfoundland, the latter of which was a stand-alone entity within the British Commonwealth until confederation with Canada in 1949. In 2001, the Canadian province was renamed Newfoundland and Labrador (NL) to better reflect the geographical region. France’s close proximity to North American soil still generates interesting twists in diplomatic relations and military strategy. Anglin (1970), Calgary (1999), and Auger (2003) present fascinating discussions of Saint-Pierre and Miquelon’s strategic global position and this significance in World War II.

The food system developed around marine ecosystems, with cod as an important species upon which the community food scape was built (Lowitt, 2012; Lowitt, 2014; Berthier, 1962). Cod is still the most frequently fished species, producing over half the volume in 2014 and part of 2015 (IEDOM, 2014; IEDOM, 2015). Shrimp, Greenland halibut, yellowtail flounder, squid, white hake, skates, albacore, Bluefin tuna, and swordfish are also economically valuable (Saint-Pierre and Miquelon Community Profile, 2015; DFA, 2002; DFO, 2007).

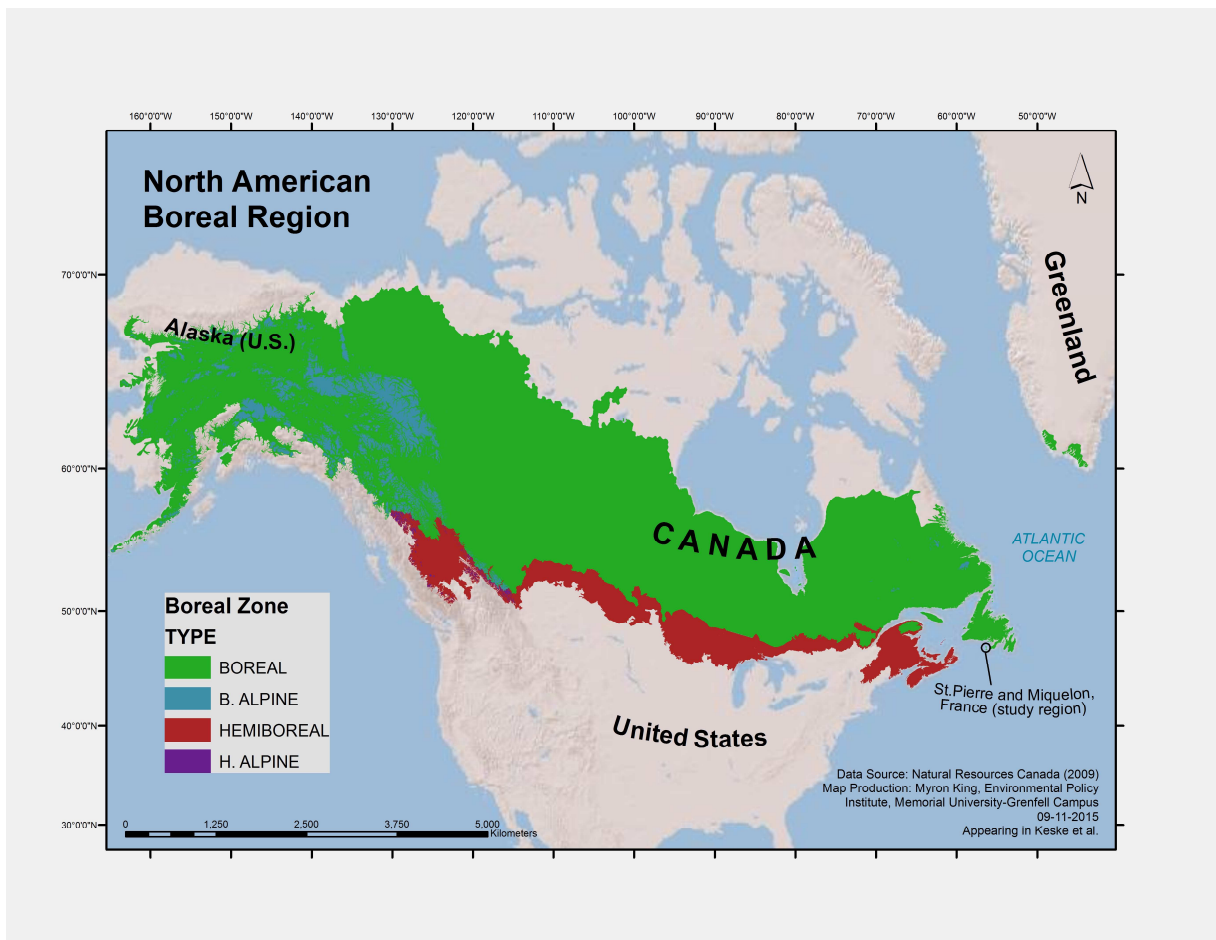
Aboriginal settlement and European exploration testimony have been tied to the archipelago's abundant fish stocks. Some scholars report that Jacques Cartier laid claim to Saint-Pierre and Miquelon after French fishermen were already working the landscape (Timothy, 2001). On June 22nd, 1816, the archipelago returned to France and it is now a Territorial Collectivity. During the second half of the 20th century, historically abundant cod stocks were overly exploited for a confluence of factors, including lack of coordinated international fishing governance (Coward, Ommer, and Pitcher, 2000); Berthier, 1962; Moguedet, 1975).

Access to fish and other natural resources (such as potential energy deposits) played a critical role in the evolution of the maritime boundaries over the centuries. Other contributing environmental factors like cold climate and poor soil quality make subsistence agricultural production relatively expensive and arguably infeasible, given modern day infrastructure and consumption preferences. We posit that this is not an unusual pattern for isolated regions in similar ecosystems.

Saint-Pierre and Miquelon is part of one of the world's largest major biogeoclimatic zones known as the North American boreal region (Brandt, 2009). Although there are technical discrepancies in precise boundaries due to various methodologies and terminologies, regardless of definition, it is indisputable that boreal ecosystems comprise a large amount of land in North America and across the globe.

Brandt (2009) defines the boreal region as 627 million hectares (ha), or 29% of the North American continent north of Mexico. Natural Resources Canada data and definitions are

integrated into Map 2 to illustrate North America’s boreal region. As shown in Map 2, the North American Boreal Region has been defined as consisting of four boreal zones: high alpine, hemiboreal, boreal alpine, and boreal. In the context of this paper it is also important to note that the study region, Saint-Pierre and Miquelon, is part of the same boreal ecozone as Canada, Greenland, and Alaska (U.S.).

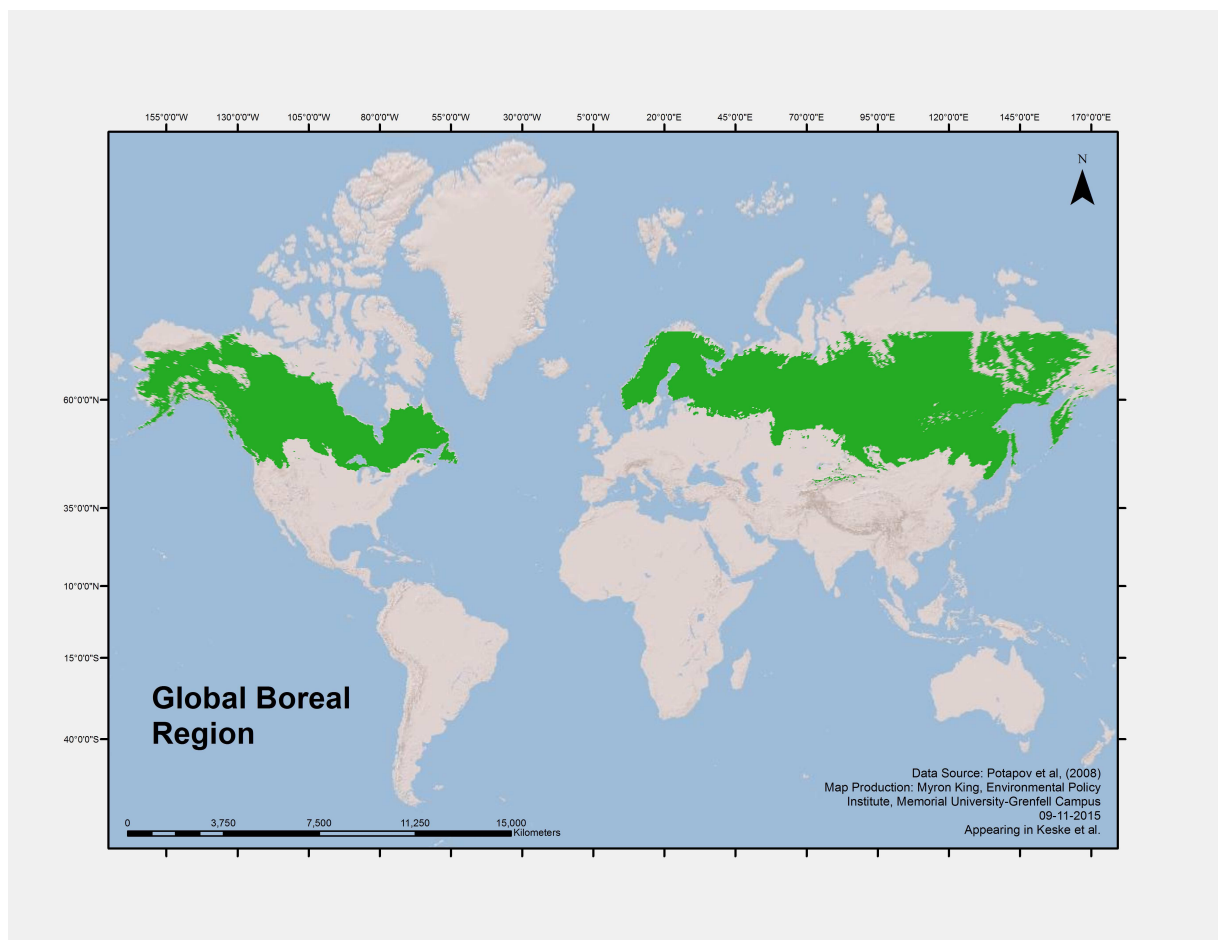


Map 2: North American Boreal Ecosystem Region.

Map 2 illustrates the four types of boreal ecozones in the North American boreal ecosystem region: high alpine, hemiboreal, boreal alpine, and boreal.

A dataset collected by Potapov et al. (2008) has been adapted to demonstrate the worldwide boreal region, as shown in Map 3. For the purposes of a world-wide

illustration, the Potapov et al. data have been selected to add ecoregions of temperate coniferous and mixed forests characterized by similar seasonality and presence of winter snow cover. The forested areas of forest-steppe ecoregions within continental parts of North America and Asia, along with forest-tundra transitional ecoregions, were also included in the boreal biome. Due to data limitations, a small portion of the boreal forest biome (Iceland and areas greater than 70° latitude in Siberia) was not processed.



Map 3: Global Boreal Region.

Map 3 illustrates the expansiveness of the boreal region across the northern hemisphere

Clearly, boreal ecosystems comprise a large land mass across the globe. Not unlike Saint-Pierre and Miquelon, much of the world’s boreal region is sparsely populated,

centered on marine systems, and distantly located from large food distribution centers. Inhabitants in rural communities throughout the boreal region rely heavily upon extraction and trade because the climate makes subsistence agriculture difficult. We assert that achieving an understanding of the food resource flows in Saint-Pierre and Miquelon lends insight into the agricultural resources and food flows in cold climates, in general.

From February 2015 through October 2015, we conducted a series of interviews with Saint-Pierre and Miquelon residents using snowball interviewing techniques (Biernacki and Waldorf, 1981) to review their perceptions of the 1992 France-Canada Maritime Boundary dispute, and the subsequent impacts on their infrastructure.



Photo 1: The urban ecosystem of Saint-Pierre and Miquelon.

The brightly coloured houses are characteristic of coastal fishing-based communities. L'île aux Marins is shown in the background. (Photo credit : Christina Detcheverry)

Saint-Pierre and Miquelon's symbiotic economic and cultural infrastructure developed around traditional fishing practices (Berthier, 1962). The region's geographical characteristics facilitated this connectivity, which is depicted on the small island, L'île aux Marins. Photo 2 shows the îles aux Marins church and the graveyard where sailors were buried. Fish were salted and dried on the pebbles emblematically described as "les graves". "La digue", the rocky infrastructure shown between the two islands was constructed in the 1950s as a barrier against the harshness of the natural elements especially during the winter months.



Photo 2: L'île aux Marins, an island in the Saint-Pierre and Miquelon archipelago.

(Photo credit: Tiffany Hancock)

Photo 2 also illustrates the modern fish processing plant "L'Interpêche" and fishing trawlers. Fishing revenues only comprised 1% of the territory's economic activity in

2014 (IEDOM, 2014), but the changes are noteworthy. For the second straight year, overall catch volume declined from traditional fishing, with a 17% decrease specifically between 2014-2015. Industrial fisheries have modestly absorbed the transition away from traditional fishing. The proportion of the total catch from industrial fisheries rose 3% between 2014-2015, and for the first time since 2008.

Approximately one-half of the labor force is employed in government service (IEDOM, 2014), and there is strategic focus on tourism sector development. Economic forecasts for Saint-Pierre and Miquelon are cautiously optimistic and unemployment has slowly declined over the past decade. However, the reality is that residents are still in transitional recovery from reduced access to local fishing resources.



Photo 3: The barrenness of the boreal ecosystem landscape and the topography of the study region.

The cold climate and poor soils make large scale agricultural production challenging.

(Photo credit: Tiffany Hancock)

When climate poses challenges for cost-effective agricultural production, it raises an interesting question about the relationship between food security and food sovereignty. The situation is further complicated when access to local food resources are restricted, as has been the case in Saint-Pierre and Miquelon. An examination of the literature provides opportunity to refine definitions and to illuminate connections between food security, food sovereignty, and food justice. As follows is a theoretical analysis of the literature, followed by a practical application to Saint-Pierre and Miquelon and similar ecosystems.

3. The connectivity of food sovereignty, food security, and spatial justice

Distinguishing between “food security”, “food sovereignty”, and “food justice” is necessary in order to define the networks and flows of boreal ecosystem agriculture. It is important to acknowledge that the terms are often naively interchanged by lay persons, because the food sovereignty and food justice academic literatures are emerging and rapidly evolving. The fundamental goals of food security and food sovereignty may be similar under various policies and contexts, but the actual practices are often viewed as distinctively different (Windfuhr and Jonsén, 2005). Under most circumstances, the terms are mutually exclusive and should not be interchanged (Schanbacher, 2010).

Food security is often associated with conventional agricultural production and reduced poverty through increased production. For the purposes of this article, we utilize the well-established food security definition promulgated by the 1996 World Food Summit as cited in Binimelis et al., 2014 (p. 325), “when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life”. The World Food Summit definition provides a preliminary and foundational understanding of food access goals. Over time,

gaps in the food security literature have emerged, leading to important distinctions in the recently emerging food justice and food sovereignty frameworks (Alkon and Agyeman, 2011; Windfuhr and Jonsén, 2005; Schanbacher, 2010; Heynen et al., 2012; Godfray et al., 2010).

By way of definition, food justice essentially addresses a human “right” to food (Gottlieb and Joshi, 2010). Equity issues are considered for both the supply and consumption sides of the market. Environmental quality and location are also of importance. One definition written by Alkon and Agyeman, (2011, p. 8) is that food justice “works to ensure equal access to the environmental benefit of healthy food.” This implies that there might be opportunity to be gained from spatial or environmental benefits of specific food systems.

Food sovereignty can be considered simply as the community’s “right to define their own food and agricultural systems” (Nyéléni Declaration 2007). Through a synthesis of literature, food sovereignty is understood as an umbrella term for a collection of approaches towards solving issues of hunger, malnutrition, rural development, environmental justice and sustainable life (Windfuhr and Jonsén 2005). The major themes identified throughout the literature are: (1) the right to food, (2) equitable access to resources, (3) sustainable agriculture, (4) equitable trade and local markets, (5) democratic control, (6) education and skills development, and (7) the cultural significance of food (Schanbacher, 2010; Heynen et al., 2012; Windfuhr and Jonsén 2005; Godfray et al., 2010).

Food sovereignty has also been described as a political movement to empower local peasant farmers to take control of their food sources and for communities to learn from this knowledge (McMichael, 2014). *La Vía Campesina* (Desmarais, 2012) is a seminal publication often used to describe an “international peasant movement” to empower rural residents. Some parts of the literature consider the international peasant movement as synonymous with food sovereignty. *La Vía Campesina* food sovereignty

movement has gained attention in Québec and in other parts of Canada, but it is viewed as being in its early stages (Desmarais and Wittman, 2014).

The notion of food sovereignty is clearly important and should be distinguished from food security. However, there is an absence of empirical study to measure differences between food security and food sovereignty. There is also a gap in the literature for food sovereignty indicators that demonstrate how well communities define their food systems, or the extent to which residents are empowered to control their food network. Empirically evaluating food sovereignty and food security in rural regions like Saint-Pierre and Miquelon or NL is complicated by the fact that these are rural areas within relatively wealthy nations. France and Canada provide considerable subsidies and social programs to these respective regions, yet benefit from the subsequent natural resource exploitation. France also directly benefits from Saint-Pierre and Miquelon's strategic geo-spatial position. In other words, until additional measurements distinguish food security from food sovereignty, we consider both terms as important and related, but somewhat distinct.

We posit that food justice and food sovereignty are especially important for understanding of how food security "ought" to be attained. Food justice is linked to environmental justice and social justice goals. Food sovereignty, or empowerment of local residents to govern their own food supply, involves a series of approaches to facilitate the process of reaching those goals (Schanbacher 2010). While food security is inarguably at odds with food sovereignty in some ways, we believe that there is connectivity between food security, food sovereignty, and food justice. Food justice or the "right to food" in cold climates relies, at least in part, upon citizens attaining both food sovereignty and food security. We believe that this plays out differently in temperate climates that are conducive to agricultural production compared to cold climates where agricultural production is costly.

4. Food sovereignty issues in Saint-Pierre and Miquelon

We now apply the academic discussion specifically to the Saint-Pierre and Miquelon case study. Results from the snowball interviews with Saint-Pierre and Miquelon residents are contrasted with results from 47 individual, semi-structured interviews conducted in NL from October 2014-January 2015 about the boreal ecosystem agriculture and the NL supply chain (Keske, 2015). Results of the interviews are presented as a paired comparison between two qualitative research studies, in a mixed methods research design (Tashakkori and Teddlie, 1998). Both areas exhibit similarities in climate, natural resources, and sources of potential food system disruption. However, the cultural significance of food is different for the two areas.

Since we control for similarities in climate, we believe that the differences arise from long-term national identity. This is likely exacerbated by the fact that both NL and Saint-Pierre have relied upon imports for centuries to supplement fishing and their access to specific products has been reinforced over time. The paired comparison between the regions demonstrates that differences exist between what residents deem as culturally significant food, despite other commonalities. Since the food sovereignty literature is still emerging, we believe that our case example presents a unique contribution to the literature. Food sovereignty should preserve the right to import food that is deemed of cultural importance. We discuss this in greater detail and we illustrate how the France-Canada Maritime Boundary dispute has affected food sovereignty in Saint-Pierre and Miquelon.

Home gardening is possible in these boreal climates, but it is not an easy row to hoe. Ethnographic study of nearby NL documents a history of subsistence lifestyles augmented by goods arriving by sea (Omohundro, 1994). Home and roadside gardens facilitated winter survival until trade ships delivered staples like molasses, flour, butter, and tea (Omohundro, 1994; Murray, 2002). Crops like potatoes, cabbage, carrots, beets, turnips, bean and rhubarb complemented limited animal husbandry, including dairy production (Murray, 2002). NL subsistence hunting included moose, caribou, sea birds

and their eggs. Newfoundlanders relied upon fishing and imports from the British Crown for survival (O’Flaherty, 1979). This economic cycle defined NL’s food system and food scape (Omohundro, 1994; Lowitt, 2014).

Saint-Pierre and Miquelon has similar climate, ecosystem, and trade practices, but French governance gave rise to different trade sources and distinct cultural customs over the centuries. The Saint-Pierrais consumed sea birds and fish, but colonization unfolded differently, which influenced their palates. Omohundro (1995) reports that the Saint-Pierrais “lazy bed” home gardening techniques are similar to the Newfoundlander’s, but they instead grow “luxury crops” like lettuce and leeks that are of French cultural significance. Pâté de foie gras, terrine, confit, crème fraîche and pastries are among many French culinary specialities incorporated into the food scape (Walsh, 2015). These are complemented with locally caught seafood and livestock. The French culinary and cultural tourism experience is promoted as a pocket of France at the edge of Atlantic Canada (Timothy, 2001). In many ways, this perpetuates Saint-Pierre and Miquelon’s reliance on mainland imports, because tourism economic activity requires the availability of these products.

Saint-Pierre and Miquelon’s distinct culture and cuisine is complicated by isolation from the French central government. This necessitates further clarity on how food sovereignty is defined. The process by which healthy and culturally appropriate food is procured is highly relevant to the goal of securing ‘appropriate’ and ‘healthy’ food for everyone over time (Levkoe 2006; Levkoe, 2013; Schanbacher 2010; Wittman 2011). This includes preserving the right to import food, if the citizens decide that imports are healthy or culturally appropriate.

Much of the food to Saint-Pierre and Miquelon comes directly from France although some is imported from international partners. This includes live Canadian ducks used in paté de foie gras (Walsh, 2015). Tourism requires a food system that supports its infrastructure and contributes synergy to the food culture (Timothy, 2001). Economic data from INSTITUT D’ÉMISSION DES DÉPARTEMENTS D’OUTRE-MER (IEDOM), which

acts on the behalf and authority of the Bank of France, supports our premise (IEDOM, 2015). Their numbers show that there is high importation of fresh produce and exportation of fish (primarily cod). IEDOM also shows that tourism is a robust economic sector. Many factors influence what modern-day residents deem as healthy and culturally appropriate (Montevecchi et al., 2007).

Food sovereignty also involves sustainable agriculture and equitable access to resources. This requires understanding how the underlying biological and ecosystem processes link to use over time. Biological processes should be considered when policies are developed so that food sovereignty and sustainable resource management can be facilitated. Unfortunately, when equitable access and sustainability are factored, Saint-Pierre and Miquelon has not attained food sovereignty over its marine resources. Long-standing disputes with NL and Canada about fishing boundaries and resource management contributed to cod stock depletion. Canada implemented a cod fishing moratorium in 1992 that is still largely in effect. This reflects a classic economic common pool problem (Demsetz, 1967; Coward, Ommer, and Pitcher, 2000).

Arguably, much of the ecosystem damage was already done before the two nations entered into international arbitration leading to the 1992 Maritime Boundary decision. Figure 1 presents a timeline summarizing the key events that affected Saint-Pierre and Miquelon's sovereignty in the region.

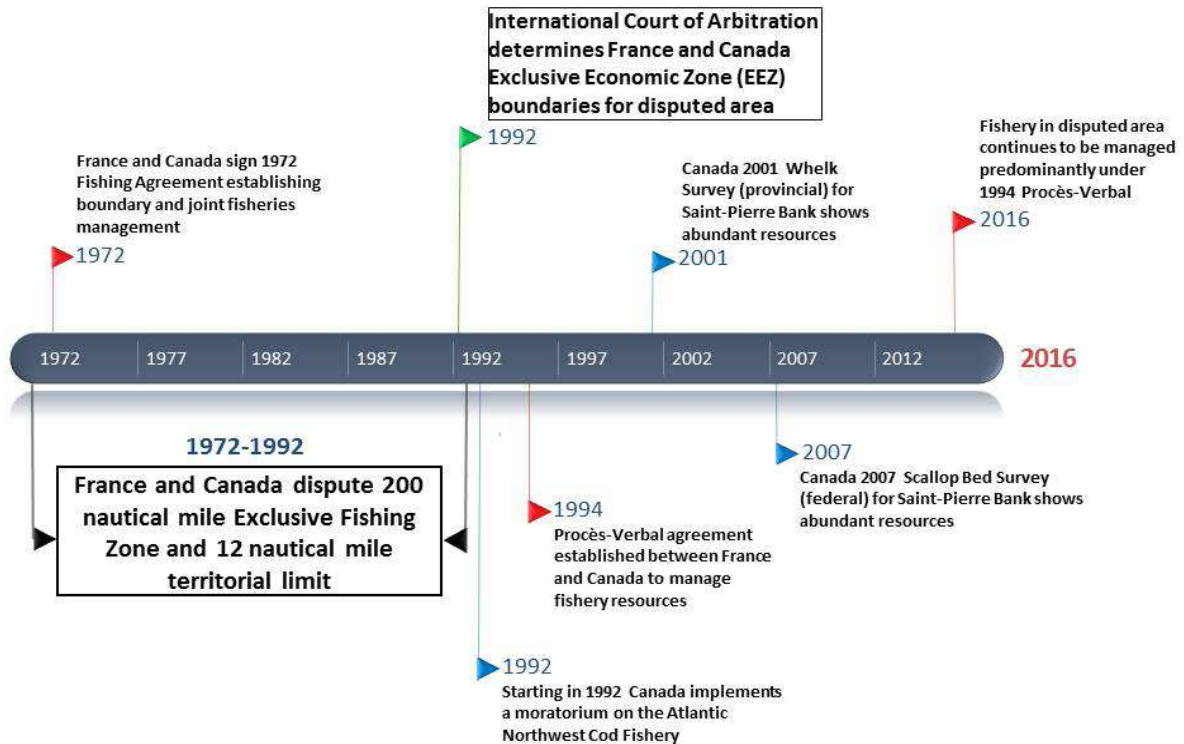
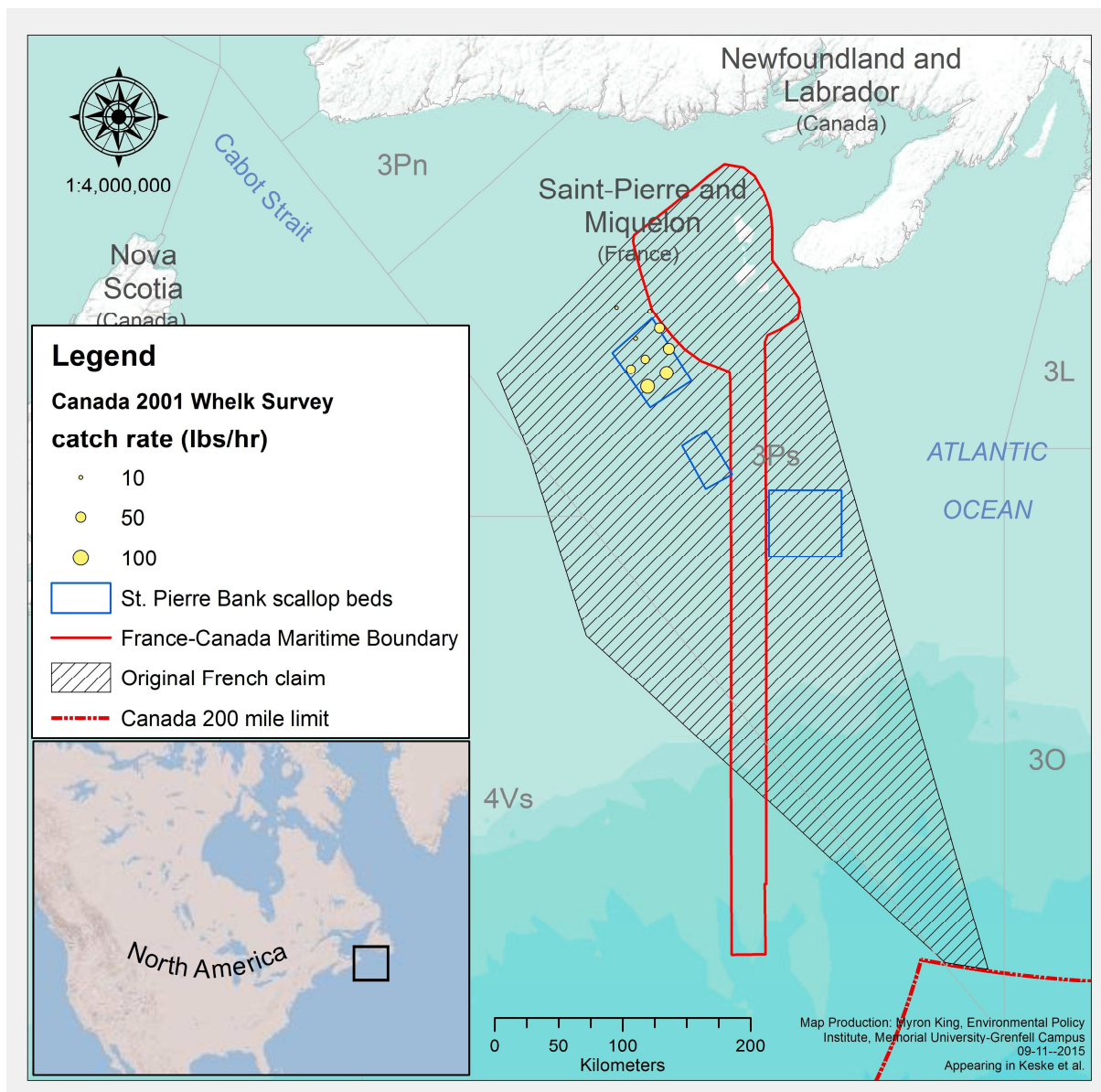


Figure 1: Timeline of France-Canada Maritime Boundary Dispute

Canada aimed to minimize territorial gains for France, but France sought a larger parcel extending as far south as international waters. Map 4 shows the “original” French request that includes the rich scallop beds of Saint-Pierre Bank. These are expressed in catch weight per hour according to one recent survey. The waters in the North Atlantic Fisheries Organization (NAFO) 3Ps Division region are shallower, have more nutrients, and are more favorable for fishing, especially along the Saint-Pierre Bank.

The International Court of Arbitration viewed both claims as highly exaggerated. The Court used its own methodology to create the mushroom-shaped Maritime Boundary shown in red on Map 4. (COURT OF ARBITRATION, 1992). Notably, the scallop beds of Saint-Pierre Bank are outside of the region. The limited corridor does not allow France direct access to international waters without traversing Canada’s boundary that extends

200-miles from shore. France retains the right to fish in the disputed area under the 1972 Fishing Agreement and 1994 Procès-Verbal (Vignes, 1995).



Map 4: France-Canada Boundary Dispute.

Map 4 illustrates the France-Canada Maritime Boundary relative to the maritime boundary request presented to the International Court of Arbitration. Whelk

concentration and scallop beds are shown as part of a 2001 Whelk Survey (DFA, 2002; DFO, 2007). The 1992 Court of Arbitration awarded these rich fishing grounds predominantly to Canada.

Economic theory demonstrates that assigning property rights can address common property resource depletion. This provides incentive for the “owner” to sustainably manage the resources over time (Demsetz, 1967). The Court’s majority opinion seemed to form around this premise. The Court noted that designating access and control of fisheries in the disputed area would facilitate more sustainable resource use (COURT OF ARBITRATION, 1992). However, by allocating property rights to Canada rather than France, the Saint-Pierrais failed to gain sovereignty over marine areas that would have provided greater economic opportunity.

In their minority opinions, the two dissenting judges mention Saint-Pierre and Miquelon’s loss of resources and economic sovereignty (COURT OF ARBITRATION, 1992). Mr. Weil (appointed by France) and Mr. Gotlieb (selected by Canada) were the only two nationals on the five member international panel. Mr. Weil did not believe the solution was equitable to the Saint-Pierrais in part because they would never be able to fully benefit from the EEZ due to the boundary shape. He stated that the Court did not provide proper attention to all of the potential economic or social factors, including the fisheries. Meanwhile Mr. Gotlieb felt the boundary delimitation was inequitable and that the Court did not employ appropriate methodology to assess equity. Mr. Gotlieb concurred with Mr. Weil that France should have been granted additional access to the continental shelf area beyond Canada’s 200-mile limit (United Nations Digest, 2006).

In the decades following the Maritime Boundary decision, scientific research verifies the rich resources available on Saint-Pierre Bank. The Court indicated that potential mineral resources did not affect the delimitation decision (COURT OF ARBITRATION, 1992). However, recent geological assessments verify subsea hydrocarbon resources situated off Newfoundland’s coast that in all likelihood may extend into the disputed region.

The NL 2001 Exploratory Whelk surveys document potentially viable and sustainable resources within the 3Ps NAFO division (DFA, 2002). The three separate sea scallop beds on the Saint-Pierre Bank comprise a valid pulse fishery. The ecosystem is viewed as stable for fishing, although stocks fluctuate enough so that the annual fishing quotas vary every year (DFO, 2007).

These rich sea scallop beds are within the original French request subsequently awarded to Canada. If the Court of Arbitration implemented different scientific, economic, and equitability assessments guidelines, clearly Saint-Pierre and Miquelon would have had greater potential for economic growth and well-being. In a series of interviews, Fleury (2006) reveals the resentment the Saint-Pierrais felt from loss of food sovereignty and access to economic resources. They are angry at France for not fighting harder for their right to access economic resources. They also criticize Newfoundland and Canada for unsustainable fishing practices leading to resource depletion. They express disappointment towards the Court of Arbitration for awarding the shallow ocean beds and majority of NAFO Division 3Ps to Canada, thereby relegating the poorer quality ocean resources to France. In bitter frustration, the Saint-Pierrais express humiliation that the 1992 Maritime Boundary leaves them as nothing more than a “French baguette” of mainland France with limited opportunity for self-sufficiency. The ruling also prevented access to geologically available hydrocarbon reserves, which would have served as a source of revenue for the Territory (Plantegenest et al., 2003).

The loss of fishing sovereignty has been shown to affect individual and community identity (Power, 2005). The archipelago’s culture clearly formed around fishing. As shown in photos, geographical features like pebbles used for fish preparation evolved into the cultural and spiritual fabric of îles aux Marins. In the photos, below, “le vieux frigo” (literally, “the old fridge”) retains its prominent position on Saint-Pierre’s port much like an old castle. It was built in the 1920s at the end of World War 1 for storing frozen fish to supply food for the allied forces in case of prolonged conflict. For a brief period of time beginning in the 1950s, the S.P.E.C. operated as a fish plant employing

300 people. It is a reminder of the social and economic changes introduced with improvements in refrigeration technology that expanded the fish market to North America (Berthier, 1962). Like the French food imported from the mainland, Saint-Pierre and Miquelon's fishing resources provide high cultural value.



Photo 4: "Le Vieux Frigo"

This building is locally known as "le vieux frigo" and is officially called the S.P.E.C. (société de pêche et de congélation). (Photo credit: Christina Detcheverry)



Photo 5: The components of the fishing industry in Saint-Pierre and Miquelon.

Shown are the fish rings, the fishing trawlers and the fish processing plant l'Interpêche.

(Photo credit: Christina Detcheverry)

Saint-Pierre and Miquelon reflects an interesting nexus of food sovereignty, food security, and food justice. Sustainable fisheries management is linked to food security over time. There is no question that marine resources in this boreal ecosystem were damaged to the point where drastic intervention was necessary. Even though Saint-Pierre and Miquelon lost food sovereignty over the fishing resources, we cannot predict how they would have managed their resources if their Maritime Boundary delimitation request was granted. It is possible that over-exploitation of the region may have continued.

However, blame for unsustainable fisheries management and the Newfoundland cod industry crash cannot be laid at the feet of the Saint-Pierrais. Likewise, it is also a

mistake to place full responsibility on their Newfoundland neighbors. It has also been argued that Newfoundland does not have sovereignty over its fisheries and fish processing plants (Coward, Ommer, and Pitcher, 2000; Omohundro, 1994; Power, 2005). Ecosystem connectivity means that depletion in one region has the potential to affect other regions, frequently irrespective of political boundaries. Along these same lines of thought, food security is a global scale issue. Worldwide players that exploited fish resources from the region arguably had their own nation's food security interests in mind. There is opportunity to restore Saint-Pierre and Miquelon's sovereignty over its resources, which may ultimately lead to spatial justice. Since we can only move forward in time, it is useful to review opportunities for Saint-Pierrais to re-establish sovereignty and obtain food justice.

5. The Saint-Pierre and Miquelon food system: food sovereignty facilitates spatial justice

We conclude that policies to facilitate food sovereignty will lead to food justice over time. The right to define food that is culturally appropriate or that is of cultural significance should also be considered. We develop a case study on boreal ecosystem agriculture, but this logic may apply to other regions of the world with oppressive climatic forces, such as arid climates with limited water supplies. We also believe that the temporal component is particularly important for remotely situated territories appurtenant to relatively wealthy nations, where logistics may delay the implementation of national policies.

Such policies could be at odds with strict definitions of food security. Self-contained agricultural production is expensive and difficult in rural boreal ecosystem communities like Saint-Pierre and Miquelon. As described under the renowned Heckscher-Ohlin economic model, residents import agricultural staples that require relatively more intensive resources, and they export goods that are relatively abundant (O'Rourke and Williamson, 1999). Under certain circumstances (not unlike the study region), the cycle

arguably perpetuates reliance and resource depletion. However, even if food can be produced abundantly and cost effectively on location in greenhouses, there is still a need for food sovereignty. Therefore, we believe that advancing the community's "right to define their own food and agricultural systems" under the Nyéléni Declaration should be prioritized so that spatial justice can be facilitated.

We advocate for a more formalized measurement of how Saint-Pierre and Miquelon residents wish to define their food and agricultural systems. In this article, we use results from two qualitative studies to explore the cultural significance of food, sustainable agriculture, and equitable trade as dimensions of food sovereignty. It is naïve to believe that all dimensions of food sovereignty can be achieved simultaneously. The most obvious next step is to integrate results from the qualitative interviews and compile these into trade-offs for Saint-Pierre and Miquelon residents. The benefits, costs, and trade-offs of these decisions should be accurately quantified so that they can express their preferences and make informed decisions. The small, relatively concentrated population may encourage high participation at public meetings, or at least ensure that enough residents are engaged to ensure that a representative sample is drawn. As shown in prior studies of rural communities reliant on tourism and natural resource extraction, audience response system technology could be utilized to keep deliberations anonymous (Keske and Smutko, 2010). France also acknowledges the importance of community participation in governance of fishing within its territorial waters (Picault and Lesuer, 2015). In other words, an empirical study of community preferences and trade-offs could be an important step towards re-establishing food sovereignty in Saint-Pierre and Miquelon.

In order to achieve spatial justice, both France and Canada should respect the Saint-Pierrais and design policies that facilitate their right to define their own food (Loo, 2014). By way of example, it is critical for France to ensure that the Saint-Pierrais are able to access French goods at socially acceptable prices. The tourism sector exhibits promising economic development opportunities that should be fostered by mainland

France. As a self-governing territory, Saint-Pierre and Miquelon is vulnerable to regressive tax policy from France and international trading partners. Canada may wish to consider revising policies to better support economic development between Saint-Pierre and Miquelon and nearby NL, where there is a demand for locally produced products (Walsh, 2015).

The France-Canada Maritime Boundary reflects an obvious loss of sovereignty for the Saint-Pierrais. As fish stocks recover, both nations may wish to revisit the boundary issue and revise policies that will improve food sovereignty for Saint-Pierre and Miquelon. In the interim, there should be recognition that property rights can be successfully implemented as a policy mechanism in fisheries management. The “owner” is provided incentive to manage the resource over time. In these situations, we believe that democratic control and regulation are important. Foley et al. (2015) examine Canadian policies surrounding fishing governance in nearby rural NL fisheries. Governance that prioritizes equity subsequently benefits small-scale fisheries and their communities by facilitating access and distribution. This encourages food resources of benefit to residents in rural and remote coastal regions (Foley et al., 2015).

Saint-Pierre and Miquelon may also be able to attain additional food sovereignty and food justice by muscling through the regulation and decision-making process of fisheries in the disputed region. The majority of the fisheries management in the shared region stems from the 1994 Canada-France Procès-Verbal agreement. Depending on the targeted species, a percentage of total allowable catch (TAC) belongs to Canada and the remainder falls to France. The management and decision-making process in the disputed region is still murky. Migratory fish stocks change and recruitment fluctuates each year and the annual future TACs cannot be predicted. Under the terms of the agreement, allocation of a sustainable and economically viable TAC involves co-management and co-decision making. Since economic and socio-economic factors arguably exist for both parties in relation to their co-management responsibility, we

believe these factors should factor into the fisheries quota decisions as a supplement to the targeted resource stock status itself.

In summary, we believe that if food sovereignty is prioritized then citizens will be empowered to develop their own policies and mechanisms to manage food systems and security. There is opportunity to foster connectivity between food security, food sovereignty, and food justice in Saint-Pierre and Miquelon. If done successfully, it could present a model that can be used to achieve spatial justice across the world.

About the authors: Catherine M.H. Keske, Ph.D., Associate Professor, Memorial University of Newfoundland, Grenfell Campus, Division of Social Science, Environmental Studies (ECON), ckeske@grenfell.mun.ca ; Catherine.Keske@colorado.edu

Jennifer Brooke Dare, B.A., Master of Arts Candidate, Memorial University of Newfoundland, Grenfell Campus, Division of Social Science, Environmental Policy Institute, jbd646@mun.ca

Tiffany Hancock, M.A., Lecturer, Memorial University of Newfoundland, Grenfell Campus, Division of Arts, French Studies, thancock@grenfell.mun.ca

Myron King, M.Sc., Research Associate, Memorial University of Newfoundland, Grenfell Campus, Environmental Policy Institute, mking@grenfell.mun.ca

To quote this article: “The connectivity of food security, food sovereignty, and food justice in boreal ecosystems: the case of Saint-Pierre and Miquelon” *justice spatiale | spatial justice*, n°9, January 2016, <http://www.jssj.org>

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